From the Executive Director – MinEx CRC bid

In the last few months, the GSNSW has been actively involved in discussions around the establishment of the MinEx Cooperative Research Centre (CRC). The Stage 1 bid for the CRC was submitted to the Federal Government in July. It includes $36.5 million in pledged cash contributions from Geological Surveys and the minerals industry, and close to $100 million in-kind contributions. The request to the Federal Government is for $50 million cash, which adds up to almost $190 million of mineral exploration related research over the proposed 10 year life of the CRC.

The prospectus for the MinEx can be downloaded here. A key component of the proposal is the National Drilling Initiative (NDI), a precompetitive drilling program that utilises the RoXplorer® coiled tube drill rig developed by DET CRC, to characterise the undercover extensions of prospective geological terranes. The NDI will be a major part of the CRC if it’s funded, with Geoscience Australia and five state geological surveys (NSW, SA, Tasmania, Victoria and WA) pledging a combined $23.6 million in cash and double that in-kind towards it.

If the Stage 1 bid is accepted, a fully detailed bid will be due in November and successful CRC applications will likely be announced in March of 2018. If successful, the MinEx CRC will commence in July 2018 and run to 2028. The GSNSW is excited about this possible major mineral exploration-focused initiative and its potential to open up new areas of the state to mineral explorers.

Chris Yeats

New products

Advanced mineral projects map for NSW

The July 2017 issue of the Advanced mineral projects & exploration highlights in NSW map is now available.

Quarterly Note 149

Quarterly Note 149 focusses on geophysics in western NSW, featuring a 3D model of the Koonenberry Belt based on potential field data, and an analysis of negative magnetic anomalies in the Thomson Orogen.
Regolith maps
Yantara, Milparinka, Olive Downs and Tibbooburra 1:100,000 regolith maps are now available.

Geophysics interpretation maps
Hay, Bourke, Cobham Lake and Milparinka 1:250,000 geophysical–geological interpretation maps are now available.

Southern New England Orogen Mineral Potential Atlas

Seamless Geology, Zone 55 East – data release
August saw the release of the Seamless Geology dataset for Zone 55 East (i.e. central NSW, between 147°E and 150°E longitude). The Zone 55 East Seamless Geology Data Package is a GIS compilation of the best available digital geological mapping data from the eastern half of UTM Zone 55. The data have been compiled using an internally consistent database schema. Edge-match problems between geological maps of different eras have been resolved and, using geophysical and drillhole data, many of the geological layers have been inferred under cover sequences to give a series of solid geology layers showing major geological subdivisions in subsurface and outcrop. The new data package now supports the popular free GIS software QGIS, in addition to ArcMap, ArcGIS Pro and MapInfo. In coming months this dataset will be released for mobile platforms (Android and iOS) and as web services.

The Zone 55 East Seamless Geology Data Package is the 3rd major data release of a 5 year project to produce a best available Seamless Geology for the whole of NSW. Previous outputs were released in February 2015 (Zone 56 Seamless Geology) and December 2016 (Zone 54 Seamless Geology) and are available for free download from the Department of Planning & Environment website. The project will move to the western half of UTM Zone 55, which is scheduled for release in mid-2018. The release of Zone 55 West will complete the Seamless Geology coverage of NSW and see the end of Phase 1 of the Seamless Geology Project. Following completion of Phase 1, the final NSW Seamless Geology dataset will be continually updated and refined as new geological mapping data become available.

The new dataset is available in ArcGIS (10.3.1 or later), ArcGIS Pro (1.4 or later), MapInfo (11.5 or later) and QGIS (2.18.0 or later) formats.

Contact: gary.colquhoun@industry.nsw.gov.au (02) 4931 6735

NSW Seamless Geology Zone 54 for mobile maps
Two new interactive seamless geology mobile maps have been developed for Zone 54 and are available to be viewed and interrogated using NSW Geology (iOS) and Locus (Android) mobile applications.
The NSW seamless geology database for Zone 54 has been converted into a mobile map format. This new map features the best available surface geology across Zone 54, including rock unit information with interactive pop-ups, along with symbolised rock unit boundaries, faults, structural readings, trend lines and base data.

Zone 54 Seamless Geology viewed on an Android phone using Locus Maps.

The NSW Seamless Geology Zone 54 Broken Hill Outcrop mobile map showcases the detailed outcrop data from the Broken Hill 1:25 000 lithological map series (Note: the attribution has been simplified). Over 145,000 polygons can be previewed on your mobile device, with interactive pop-up information for each outcropping unit. This map also features symbolised rock unit boundaries, faults and base data.

Once the maps have been downloaded to your mobile device, no mobile data connection is required. Your mobile’s GPS will locate your exact position on these maps in the field, which is useful for fieldwork in remote Zone 54 locations without mobile coverage.

For more information see https://www.geoscience.nsw.gov.au/phonemaps/

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Project updates

Southern Thomson Orogen Project: stratigraphic drilling

Five drillholes have successfully sampled basement rocks of the Thomson Orogen, beneath the Eromanga Basin, in the Bourke-Hungerford area of remote northwest NSW. The drilling program is part of the cross-border collaborative Southern Thomson Orogen Project between GSNSW, the Geological Survey of Queensland and Geoscience Australia. It is part of the national UNCOVER
Initiative, which aims to reverse the decline in Australia’s known mineral reserves by providing new information to explorers about undercover regions.

Rocks of the Thomson Orogen are potentially prospective for copper, lead–zinc, gold and other metals, however very little is known about them because they underlie the Eromanga Basin. The Southern Thomson Orogen Project initially acquired and analysed airborne and ground-based geophysical surveys, then undertook surface geochemical sampling, field mapping and satellite image analysis to define areas of interest within this vast region (300 km by 300 km).

A drilling program is testing distinctive basement signatures in the aeromagnetic data (locations in Figure 1) using a combination of rotary mud drilling through cover sequences and diamond drilling of underlying basement rocks to provide around 50 m of representative core samples from each site (examples Figure 2). Wireline geophysical logs are being run in the holes prior to casing. Preliminary drilling details to date are summarised below.

<table>
<thead>
<tr>
<th>Site ID (see map)</th>
<th>Total depth (m)</th>
<th>Basement lithology</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSNSW Milcarpa 1</td>
<td>290.9 m</td>
<td>Rhyodacite</td>
</tr>
<tr>
<td>GSNSW Euroll 1</td>
<td>153.7 m</td>
<td>Metasedimentary schist</td>
</tr>
<tr>
<td>GSNSW Tonga 1</td>
<td>312.8 m</td>
<td>Granodiorite</td>
</tr>
<tr>
<td>GSNSW Laurelvale 1</td>
<td>386.8 m</td>
<td>Siliciclastic turbidite</td>
</tr>
<tr>
<td>GSNSW Janina 1</td>
<td>222.2 m</td>
<td>Granite</td>
</tr>
</tbody>
</table>

All cores will be comprehensively sampled for mineralogy, geochemistry and geochronology, and will be scanned by the HyloLogger™. Results will be made publicly available through the GSNSW website and presented at Southern Thomson Project workshops.

![Location of drill sites in the Bourke–Hungerford region.](image)
Photos of rhyodacite core from Milcarpa 1 (top), metasedimentary schist from Eurol 1 (centre) and granodiorite from Tongi 1 (bottom).

Contact: rosemary.hegarty@industry.nsw.gov.au

**Coonabarabran airborne geophysical survey completed**

As part of the Coonabarabran Project, acquisition of airborne magnetic and radioelement data occurred between 18 May and 30 July. The aircraft flew east-west traverses of 250 m spacing, at an altitude of 60 m. Final data processing has commenced and data should be publicly available in two months.

The survey area includes Warrumbungle National Park, where geologists from GSNSW and the Office of Environment & Heritage have been mapping. The park’s distinctive landforms and rocks are due to hot spot volcanism; the park encompasses a volcano that was active 13–17 Ma. The geophysical data particularly helped the mapping team to differentiate volcanic units.

The survey was funded by the GSNSW New Frontiers initiative, with project management by Geoscience Australia. The survey data were acquired and are being processed by UTS Geophysics Pty Ltd. To be notified when the Coonabarabran airborne magnetic, radioelement and
Preliminary ternary radioelement image from the Coonabarabran Project. In a ternary radioelement image red, green and blue respectively represent the naturally occurring radioactive elements K, Th & U. The zoom insert shows the radioelement signature of the central volcanic vent.

**Strategic release for coal and petroleum exploration**

In July, the Advisory Body for Strategic Release met for the first time. The independently chaired intergovernmental committee will advise the Minister on potential areas to release for coal and petroleum exploration. It includes representatives from the departments of Premier and Cabinet, Planning and Environment (including the Division of Resources and Geoscience), Industry, and Treasury. It is currently chaired by the NSW Chief Scientist and Engineer, Mary O’Kane, while a substantive Chair is sought. **Expressions of Interest** are invited from suitably qualified candidates to fulfill the role as Chair of the Advisory Body for Strategic Release until midday on 15 September 2017.

Through the Strategic Release process, areas will only be released for coal or petroleum exploration following careful consideration of economic, environmental and social factors through the Preliminary Regional Issues Assessment (PRIA) process. The PRIA will include community and stakeholder consultation and will identify any potential land use constraints or conflicts prior to the release of an area for exploration.

Minister for Resources, the Hon. Don Harwin, announced on 6 June that the first two areas to be considered by the Advisory Body are the Bancannia Trough and Pondie Range Trough of the Darling Basin, in the state’s far west. When the Advisory Body nominates an area for PRIA, this information will be made public.

Contact: kevin.runing@industry.nsw.gov.au
East Riverina mapping

Field mapping is currently focussed on the Tarcutta, Holbrook and Narrandera areas. The team will soon be presenting some project outcomes at Discoveries in the Tasmanides in Orange and at the Granites@Benalla2017 conference. See East Riverina Mapping Project webpage for more information, including links to products, and the most recent quarterly project update (15 July).

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Predictive mineral potential mapping

In the first phase of this project (2016–2021) GSNSW will be generating predictive 2D GIS models for each significant mineral system in all NSW basement provinces. A mineral potential atlas will be produced for each province. The atlas contains all the GIS data supporting the mineral potential maps for each mineral system. This includes training data points, study area grids, predictive map grids, weights tables and mineral potential grids. The atlas also contains a detailed spatial data table, which is an important document containing information relating to the various GIS files including methods for creating predictive maps, model set up, spatial correlation statistics and predictive maps combinations used for the final mineral potential maps.

The first province to be tested was the Southern New England Orogen. This province was analysed for three potentially economic mineral systems: intrusion-related Au, intrusion-related Sn–W, and orogenic Au–Sb. Kenex Pty Ltd was commissioned to work with our Mineral Systems team to perform the analysis. They employ a robust weights-of-evidence approach to the solution, which resulted in between 71 and 101 predictive maps for each mineral system, distilled down to 18 for the final models.
Potential for intrusion-related Au mineralisation in the Southern New England Orogen.

Related reports include:

New England metallogenic map

A new regional metallogenic map for the New England Orogen is being prepared. The New England Special 1:750,000 Metallogenic Map builds upon the Zone 56 seamless geology and recent SHRIMP dating and whole rock geochemistry for the southern New England Orogen. It brings together over 30 years of mineral occurrence/deposit data gathering for this important part of NSW.

This map highlights the role that granite chemistry and depositional environment play for a range of deposit types. Granites are classified by age, fractionation and redox parameters, highlighting
the relationship between these and tin–tungsten, gold and molybdenum mineralisation. For other deposit types, the host rock package has been subdivided by age, depositional environment (deep marine, shallow marine and terrestrial) and presence/absence of significant rock types (as volcanic units, limestones etc.) within these packages. This breakdown highlights the close relationship between the metalloegeny and source/depositional environment of many of the important mineral systems.

Over 1650 metallic and related mineral deposits will be shown on the map, with inset maps showing important districts in detail. A time-space plot will summarise the main mineralising events and a regional synthesis of geological environments in the area. The back of the map will feature the mining history and a geological synthesis highlighting the metalloegenic history of the area. We expect to finalise the map by the end of the year.

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**Mendooran drilling**

Drilling of the first of five boreholes for this project, targeting coal measures in the Mendooran–Elong Elong area, commenced on 23 August. The first drillhole, near the village of Mendooran, is Wallaroo 1. It is expected to have a total depth of about 350 m, with at least one of the holes expected to reach a depth of over 500 m.

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**Online resources**

**New MinView released**

MinView is a web mapping application which provides free access to view, search and download a comprehensive range of geological and geoscientific data for NSW. It also provides a range of supporting reference data by which to contextualise the geoscientific data including, present and past exploration and mining titles, areas available or not available for exploration, and cadastral information. There are over 50 unique map layers available to explore.

MinView draws together a vast array of different data types and formats from the department’s existing databases, including the Geoscientific Data Warehouse and the Titles Administration System, with the intention of providing easy, public access to all validated, non-confidential data from a single map interface.

You can interactively view, search and download our data or choose to build a custom map, which can be shared as a unique URL or annotated and then printed in hardcopy.

Contact: Trisha.Moriarty@industry.nsw.gov.au 02 4931 6598
Renewable Energy Mapping (REM) online

Our online renewable energy mapping data were updated to coincide with the 2017 Australian Clean Energy Summit (18–19 July). The update includes the addition of a new cropping residue layer and a wood processing facilities layer in the advanced online portal (sourced from DOI – Lands & Forestry). The solar, wind and hydro power generator layers have also been updated. The data can accessed from the Basic REM Portal and the Advanced REM Portal, or downloaded from DIGS.

Drillcore news

Broken Hill core library funding

E C Andrews Drillcore Facility - Stage 2 extension approved

In mid-2016 the GSNSW put forward a Major Capital Works proposal to build a Stage 2 extension for the E C Andrews Drillcore Facility in Broken Hill. Storage at the site has reached capacity, and a lot of material is being stored outside, uncovered.

As part of the NSW Budget for 2017–18, capital funding for Stage 2 was successfully secured. This extension will provide necessary additional undercover storage for drillcore generated by historical and current exploration and mining activities from the Broken Hill region. The expansion of the facility will provide industry, academia and the public with a high-quality geological research centre in Far West NSW. Preliminary planning for the extension is currently underway, with a planned completion in the first half of 2018.

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Drillcore recently accepted at our core libraries

Approximately 12,000 m of drillcore has been accepted from February to July 2017. The drillcore comes from Archer Resources Ltd, Clancy Exploration Ltd Pty, Clarence Moreton Resources Pty Ltd, Gateway Mining Ltd/Minotaur Operations, Hera Resources, Peak Gold Mines, Sovereign Gold and other companies. View the list of recent drill core accepted at the Londonderry Drillcore Library. No core was accepted between February and July at the EC Andrews Drillcore Facility in Broken Hill.

Contact: mark.ryland@industry.nsw.gov.au 02 4777 0325

Hylogger™ activity

Northparkes Project scanning completed

The HyLogger™ unit at the WB Clarke Geoscience Centre, Londonderry recently completed scanning of 5034m of drillcore from the E26 and E48 deposits of the Northparkes mine. Data will be progressively released to the Australian Geoscience Information Network (AusGIN) Geoscience Portal over coming months. Transport and HyLogging of the drillcore were funded through National Collaborative Research Infrastructure Scheme (NCRIS).

Cobar Regional Study
A new 3000 m HyLoqqing project funded by NCRIS funds has commenced. It follows the Cobar Project completed in 2016, which involved the HyLogger™ scanning of 9336 m of drillcore from the 3 main mines at Cobar. Stage 1 of the new Cobar Regional Study includes core from the Mallee Bull, Sandy Creek and Wirlong deposits. Stage 2, expected to start early next year, will focus on other deposits in the Cobar Basin. This important study is looking at broad but subtle alteration haloes around mineral deposits in the Cobar region to assist future exploration.

National Virtual Core Library (NVCL)
So far this year, 27 new HyLogger™ datasets have been added to the National Virtual Core Library. There are currently 266 drillhole datasets available for download from the AusGIN Geoscience Portal. It is planned that 300 HyLogger™ datasets be available for download by June 2018.

Diary and contacts

Upcoming conferences
GSNSW Data workshop, Orange
Discoveries in the Tasmanides, 6–8 September, Orange
Earth Science Week Open Day @ GSNSW, 13–14 October, Maitland

Staff movements
Jodi Birch accepted the temporary position of Resource Officer with the Resources Regulator
David Collins retired
Chris Folkes accepted the position of Senior Geologist Seamless in Regional Mapping
Megan Hobbs accepted the position of Geologist, Mining and Exploration Assessment
Felix Sheldon accepted the temporary position of Geoscience Data Systems Developer
Giovanni Spampinato accepted the position of Senior Geologist 3D in Geophysics & Modelling

Products
Digital Imaging Geoscientific Systems (DIGS)
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Geoscientific Data Warehouse
Online sales: www.shop.nsw.gov.au
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Product enquiries
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Information

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Visit the Geoscience Information webpages where you will find access to online systems DIGS®, MinView, GDW, upcoming GSNSW events, news, publications and product information.

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